REMARKS

Claims 1-19 are in the case. Claims 1-6, 8-12, and 14-18 were rejected under 35 USC § 103(a) over U.S. Patent No. 5,087,591 to Teng in view of U.S. Patent No. 5,143,577 to Haas et al. and U.S. Patent No. 5,482,882 to Lur et al. Claims 7, 13, and 19 were rejected under 35 USC § 103(a) the '591 patent, the '577 patent and the '882 patent in view of U.S. Patent No. 6,183,067 to Matta. The Applicants respectfully traverse the Examiner's rejections under 35 USC § 103(a). Reconsideration and allowance of the claims are requested.

A. CLAIMS 1-6, 8-12, AND 14-18 ARE PATENTABLY DISTINGUISHED OVER THE CITED REFERENCES.

Claims 1-6, 8-12 and 14-18 are directed to substrates for micro-fluid ejection devices having characteristics that provide improved formation of fluid flow paths through the substrates. A deep reactive ion etching process is used to form the fluid flow paths through the substrate due to the thickness of the substrate and the length of the path through the substrate. By providing an etching location in the substrate that has less than 5000 Angstroms thickness of a dielectric layer or a root mean square depth of surface pitting of less than about 500 Angstroms, improved fluid flow paths may be formed by the deep reactive ion etching process.

By way of background, deep reactive ion etching is a process that involves alternating between a passivating plasma step and an etching plasma step as set forth in U.S. Patent No. 6,402,301 to Powers, et al. Plasma etching is reactive ion etching without the alternating between a passivating plasma and a etching plasma.

In the rejection of claims 1-6, 8-12, and 14-18, the Examiner concedes that the '591 patent to Teng does not teach, suggest or disclose the following claim elements: (1) a deep reactive ion etching process, (2) a substrate having a substantially dielectric material free pitted surface with the specific characteristics claimed by Applicants, (3) the surface characteristic being adjacent to a fluid openings area of the substrate, or (4) the dielectric material being selected from the specific species disclosed by Applicants.

In addition to the above deficiencies, the '591 patent also fails to suggest or disclose (5) a substrate having fluid paths or openings therein. The structures etched in the '591 patent are "contact areas" having a bottom closed area rather than fluid paths or openings through the thickness of the substrate.

The '577 patent to Haas et al. does not compensate for the manifest deficiencies of the '591 patent to Teng to provide all of the above claimed elements. In fact, the '577 patent to Haas et al. describes a device(s) from an unrelated art involving optical waveguides. Like the '591 patent, the '577 patent also suggests and discloses the use of plasma etching rather than deep reactive ion etching. The examiner is challenged to find any mention in the '577 patent to a deep reactive ion etching process.

Furthermore, the '577 patent is deficient in suggesting or disclosing the following elements of the claimed invention: (2) a substrate having a substantially dielectric material free pitted surface with the specific characteristics claimed by Applicants, (3) the surface characteristic being adjacent to a fluid openings area of the substrate, (4) the dielectric material being selected from the specific species disclosed by Applicants, and (5) a substrate having fluid paths or openings therein as set forth above.

The '577 patent does not involve the flow of fluid. In fact, the examiner has failed to show where there is any reference in the '577 patent to fluid flow paths or openings through the substrate. The device(s) described in the '577 patent involves the passage of light through optically dynamic areas like the area(s) cited in Figure 1b by the Examiner. Since there are no fluid flow paths or openings, there is also no surface characteristic present before etching the fluid paths or openings suggested or disclosed in the '577 patent. Therefore, the '577 patent to Haas et al. is also manifestly deficient in providing all of the elements of the claimed invention.

The '882 patent to Lur et al. does not compensate for the deficiencies of the '591 patent and the '577 patent to provide all of the elements of the claimed invention. Moreover, the '882 patent to Lur et al. describes completely unrelated art, i.e., modulated stacked capacitors for use in a Dynamic Random Access Memory (DRAM) cell rather than substrates having fluid flow paths or openings etched therein by a deep reactive ion

etching process. As with the previous references, the '882 patent fails to suggest or disclose the following elements of claims 1, 8, and 14: (1) a deep reactive ion etching process, (2) a substrate having a substantially dielectric material free pitted surface with the specific characteristics claimed by Applicants, and (3) a substrate having fluid paths or openings therein. In addition to the above, the '882 patent fails to suggest or disclose (4) the surface characteristic being adjacent to a fluid openings area of the substrate.

The thin insulating layer 110 of the '882 patent is not a dielectric material free pitted surface as required by the claims. If anything, the layer 110 forms a part of a masking material that is used to mask the underlying polysilicon electrode layer 40 during etching thereof whereas the dielectric material free pitted surface of the claimed invention does not mask anything, in fact, etching is conducted through that surface to form the fluid paths or openings.

The Examiner, without reference to teaching, motivation, or any expectation of success, has merely selected elements from unrelated art and attempted to reconstruct the claimed invention from selected elements. This type of "cherry-picking" of elements from unrelated references is not legally sufficient to provide an argument of obviousness under 35 U.S.C. 103(a).

Claims 2-6 depend from claim 1, claims 9-12 depend from claim 8, and claims 15-18 depend from claim 14 and provide additional aspects of the invention in combination with the independent claims. Claims 2-6, 9-12, and 15-18 are patentable over the cited references for the same reasons claims 1, 8 and 14 are patentable over these references. Accordingly, in view of the foregoing it is without question that the examiner has failed to make out a case of prima facie obviousness. Reconsideration and withdrawal of the §103 rejection of claims 1-6, 8-12, and 14-18 are respectfully requested.

B. CLAIMS 7, 9 AND 19 ARE PATENTABLY DISTINGUISHED OVER THE CITED REFERENCES.

Claim 7 depends from claim 1, claim 9 depends from claim 8 and claim 19 depends from claim 14 and these claims are patentable over the '591 patent, the '882

patent, and the '577 patent for all of the reasons set forth in section A above that claims 1, 8, and 14 are patentable over these references.

The '067 patent is only cited for the reference to an ink jet printer. The '067 patent fails to cure the manifest deficiencies of the '591 patent, the '882 patent, and the '577 patent to provide all of the elements of the claimed invention. Specifically, the '067 patent also fails to suggest or disclose the following claim elements in combination with the other references: (1) a deep reactive ion etching process, and (2) a substrate having a substantially dielectric material free pitted surface with the specific characteristics claimed by Applicants, and (3) the surface characteristic being adjacent to a fluid openings area of the substrate. Accordingly, since the foregoing claim elements are missing from the combined references, no prima facie case has been made out by the examiner. The rejection of claims 7, 9, and 19 is wholly untenable and should be withdrawn. Reconsideration and allowance of claims 7, 9, and 19 are respectfully requested.

COMBINATION OF REFERENCES

The MPEP outlines three conditions that must be met for a *prima facia* case of obviousness to be made out. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the combined references must provide all the claim limitations.

1. Motivation

The statements of the Examiner in regard to the motivation to combine the various references listed above amount to no more than conclusory statements of generalized advantages and convenient assumptions about what was known by skilled artisans.

The present claims are directed toward micro-fluid ejection assemblies and ink jet printer heater chips. Thus, the claims recite certain elements in combination, which when

combined produce such structures. Applicants do not, at this time, assert the claim that any one of these elements, taken by itself, is a novel element that has never before been conceived and reduced to practice in any art. Thus, applicants anticipate that it might be possible to find each and every element somewhere in the prior art. Even so, applicants assert that they have combined these possibly-known elements in a novel and nonobvious manner to produce an apparatus that has great benefits.

In the rejections, the Examiner has selectively extracted from the cited references only selected elements, and has attempted to rearrange those elements in a manner to provide the claimed invention.

What the Examiner has not done, and what the Examiner must do, is provide proper motivation for making the selection and combination of prior art elements. Applicants assert that without the proper motivation, the combination of elements as recited by the Examiner is not obvious. As noted above, the mere fact that various elements ***could be*** placed in combination is not a sufficient motivation for actually making the combination. An infinite number of different elements ***could be*** placed in combination, but in order to make the present combination obvious, there must be explicit motivation in the references to make the combination.

Furthermore, it is respectfully submitted that the references cited do not support combining the elements as claimed in the present invention. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d (BNA) 1566 (Fed. Cir. 1990) states that the PTO erred in rejecting a claimed invention as an obvious combination of the teaching of prior art references when the prior art provided no teaching, suggestion, or incentive supporting the combination. *See Northern Telecom Inc. v. Datapoint Corp.*, 15 U.S.P.Q.2d 1321, 1323, *In re Geiger*, 2 U.S.P.Q.2D 1276, 1278. *SmithKline Diagnostics, Inc. v. Helena Laboratories Corp.*, 859 F.2d 878, 887, 8 U.S.P.Q.2d (BNA) 1468, 1475 (Fed. Cir.1988) states that one "cannot pick and choose among the individual elements of assorted prior art references to recreate the claimed invention."

There is nothing in the prior art cited to lead a person of ordinary skill to design an apparatus like that of the present invention, other than the hindsight knowledge of this invention. The office action recites certain generalized benefits (realized in hindsight after considering the invention) as motivation for the combination of the references.

However, these generalized motivations do not make obvious the combination of the references to produce the claimed invention. Only after considering the invention is it understood how to combine certain elements (and adding a great deal more) provide the claimed invention.

This, however, does not satisfy Section 103. The motivation to combine references cannot come from the invention itself. *See In re Oetiker*, 24 U.S.P.Q.2D 1443, 1446. The claims of the present application appear to have been used as a frame, and individual parts of separate prior art references were employed to recreate a facsimile of the claimed invention. *See W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303, 312. There is no explanation of what there was in the prior art that would have caused those skilled in the art to combine the references.

The Examiner has the burden to show some teaching or suggestion in the references to support their use in the particular claimed combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 5 U.S.P.Q.2D at 1438-1439. In the absence of such, applicants respectfully suggest that the references are improperly combined.

2. Expectation of Success

It is a requirement in making out a *prima facia* case of obviousness that there must be some expectation of success of the combination constructed by the Examiner. However, the combination(s) proposed by the Examiner would have no such expectation of success. The reason for this is that the Examiner has combined the teaching of references that are sufficiently different, one from another, as to have no *expectation* of success by one skilled in the art. For example, the Examiner has cited a patent (5,143,577 to Haas et al.) describing waveguide technology—a completely unrelated application to micro-fluid ejection assemblies and ink jet printer heater chips. The Examiner has attempted to show that it would be obvious for one skilled in the art of micro-fluid ejection assemblies and ink jet printer heater chips to take certain elements of the waveguide device described in Haas et al. and implant such elements into a micro-fluid ejection assembly. The Examiner has cited no expectation of success for this substitution. Similarly, no expectation of success is cited by the Examiner in regard to the substitution of elements from the invention described in Lur et al.—an invention from

yet another art that is not related to micro-fluid ejection assemblies and ink jet printer heater chips .

3. All Limitations Taught or Suggested

It is a requirement in making out a *prima facia* case of obviousness that all of the limitations of the claims must be taught or suggested by the combined references. However, the Examiner has omitted some of the claimed elements, or at least certain important aspects of the claimed elements found in the independent claims. For example, the Examiner has failed to show any reference specifically describing a silicon substrate like the ones claimed in claim 1, 8, and 14 that has the described flow features formed therein by deep reactive ion etching.

CONCLUSION

Applicants assert that the claims of the present application patentably define over the prior art made of record and not relied upon for the same reasons as given above. Applicants respectfully submit that a full and complete response to the office action is provided herein, and that the application is now fully in condition for allowance. Action in accordance therewith is respectfully requested.

In the event this response is not timely filed, applicants hereby petition for the appropriate extension of time and request that the fee for the extension be charged to deposit account 12-2355. If other fees are required by this amendment, such as fees for additional claims, such fees may be charged to deposit account 12-2252.

Respectfully submitted,
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